STATE BOARD OF HEALTH

INDIANAPOLIS

OFFICE MEMORANDUM

DATE: December 5, 1977

THRU: qpd 12/1/77

TO: Industrial Disposal Landfill File
Lake County

FROM: Jim King JmK

SUBJECT: Geologic Description and Evaluation

GEOLOGY

The bedrock at the site consists of Middle Silurian (Niagaran) dolomites that dip gently toward the northwest. About 160 to 170 feet of unconsolidated material lies above the bedrock at the site and this surficial cover may be divided into three distinct units. The deepest unit is a silty, pebbly clay till which rests upon the bedrock. In this area the basal part of this unit is a 15-foot thick zone of sand and gravel which is part of a narrow valley-fill deposit. Above this unit is a silty, sandy and pebbly clay till which contains discontinuous lenses of sand and gravel. The unit exposed at the surface consists of 25 to 35 feet of very fine-grained beach and dunal sand that is stratified and moderately cross-bedded. It contains some thin partings of silt and clay.

SURFACE WATER

The Grand Calumet River is located along the northern boundary of the site and flows toward the west. In addition, a small polluted pond occurs in the pit in the center of the site.

GROUNDWATER

Groundwater use is low near this site due to the availability of municipal water and to a lack of residential development. The small amount of groundwater that is pumped near the landfill is chiefly from shallow wells (30 to 50 feet in depth) that are finished within the upper sand unit which is nearly totally saturated under natural conditions. Groundwater within this sand unit exists under unconfined conditions and the original water table in this area was within two feet of the ground surface before dewatering began. The original hydraulic gradient was toward the north-northwest into the river but dewatering has created a reversal of this pattern and river water now seeps into the pit area because of the existing head differential. The hydraulic conductivity of the deepest till unit is 1.4×10^{-7} cm/sec while that of the clay immediately beneath the sand unit is 3.3×10^{-7} cm/sec. The sand unit has a hydraulic conductivity of .02 cm/sec, a coefficient of transmissivity of 21.6 cm^2/sec, and a storage coefficient of 0.12 indicating that unconfined conditions exists.